

IN THE CLAIMS:

Please add new Claims 18 and 19, cancel Claim 17 without prejudice or disclaimer of subject matter, and amend Claims 1 to 16 as shown below.

1. (Currently Amended) A radiation image pick-up device for performing image pick-up by using radiation, comprising:

a plurality of ~~input pixels~~, pixels;

~~each having~~ a wavelength converter for converting incident radiation into ~~light~~, light:

~~conversion means for converting the incident radiation passing through said and the light converted by the~~ wavelength converter ~~and the light converted by said wavelength converter into a charge, said conversion means having a radiation detecting efficiency of at least 20%; into charge,~~

~~storage means for storing the converted charge, and charge;~~

~~reading~~ read means for reading a signal corresponding to the charge stored in said the charge storage means; and

a plurality of output lines for outputting the charges read from said plurality of the input pixels, said plurality of output lines being which are connected to said with the plurality of ~~input pixels~~.

2. (Currently Amended) A radiation image pick-up device according to claim 1, further comprising first reset means for resetting the charge in said the charge storage means.

3. (Currently Amended) A radiation image pick-up device according to claim 2, wherein said the plurality of input pixels, said the output lines, and said the first reset means are respectively formed on an insulating substrate, said the first reset means includes a reset thin film transistor, and each of said plurality of the input pixels includes a read thin film transistor.

4. (Currently Amended) A radiation image pick-up device according to claim 3, wherein said the reset thin film transistor and said the read thin film transistor are made of non-single crystalline semiconductor.

5. (Currently Amended) A radiation image pick-up device according to claim 1, further comprising a transparent electrode that which is located between said the wavelength converter conversion means and said the charge conversion means and transmits the light converted by said the wavelength converter conversion means.

6. (Currently Amended) A radiation image pick-up device according to claim 1, wherein the said charge conversion means has a semiconductor substrate for converting radiation into charge and a plurality of divided electrodes provided in correspondence with said the plurality of input pixels formed on an insulating substrate,

said the semiconductor substrate and the insulating substrate are laminated, and the plurality of divided electrodes and storage capacitors of the said plurality of pixels are electrically connected with each other.

7. (Currently Amended) A radiation image pick-up device according to claim 6, wherein said the semiconductor substrate is divided into plural regions.

8. (Currently Amended) A radiation image pick-up device according to claim 1, further comprising amplifiers for signal amplification in said plurality of the output lines.

9. (Currently Amended) A radiation image pick-up device according to claim 1, wherein the said charge conversion means is formed in a semiconductor substrate and has a pn junction portion.

10. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said the charge conversion means has an energy band gap ~~with a band gap of at least 1 eV or larger.~~

11. (Currently Amended) A radiation image pick-up device according to claim 2, further comprising a second reset means for resetting said plurality of the output lines, said second reset means which is connected to said plurality of ~~with the~~ output lines.

12. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said the read means is composed of a thin film transistor transistor, and the thin film transistor is made of non-single crystalline semiconductor.

13. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said the charge storage means and said the read means are formed on said the insulating substrate ~~in~~ in a the same layer structure having a lower electrode, a dielectric film, a high resistance semiconductor layer, a low resistance semiconductor layer, and an upper electrode.

14. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said the charge conversion means is made ~~of~~ of a semi-insulating semiconductor.

15. (Currently Amended) A radiation image pick-up device according to claim 1, wherein said the wavelength converter conversion means includes a phosphor.

16. (Currently Amended) A radiation image pick-up device according to claim 15, further comprising a reflective layer on a radiation incident side of the said wavelength converter conversion means.

17. (Cancelled)

18. (New) A radiation image pick-up device according to claim 1,
wherein said conversion means detects the radiation passing through the wavelength
converter at an efficiency of at least 20%.

19. (New) A method of performing image pick-up by using radiation,
comprising the steps of:

converting incident radiation into light via a wavelength converter;
converting the radiation passing through the wavelength converter
and the light converted by said wavelength converter into a charge, said converting step
converting radiation at a radiation detecting efficiency of at least 20%;
storing the charge;
reading a signal corresponding to the charge stored in said charge
storing step; and
outputting the charges read from a plurality of pixels via a plurality
of output lines connected to the plurality of pixels.